

Vol. 29, No. 01 Level C

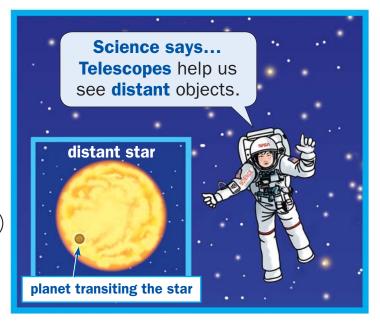
The Kepler Space Telescope

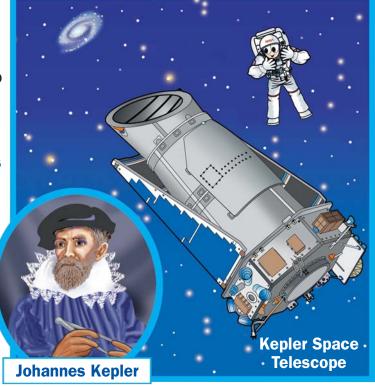
The Planet Hunter

Kepler (Kep-ler) is a space telescope (tel-e-scope). It was named after German scientist (sci-en-tist) Johannes Kepler, who described the motion (mo-tion) of planets (plan-ets) in the early 1600s. Kepler launched in 2009 and began its mission: to look for planets orbiting (or-bit-ing) stars outside our solar system (so-lar sys-tem). So far, Kepler has found 74 planets.

How It Works

It is very hard to see planets orbiting far-away stars. Kepler scientist Natalie Bathala says it is like trying to see a flea walk across a **distant** (dis-tant) car headlight. But Kepler has a powerful light **sensor** (sen-sor) called a **photometer** (pho-tom-e-ter). When a planet **transits** (tran-sits), or crosses in front of its star, the star's light dims a tiny bit. Kepler can see that change in the star's light.





Another Earth?

There are many questions scientists hope Kepler can help answer. Are there other planets like **Earth**? Might those planets have living things? Kepler is looking for planets about the same size as Earth. To have living things, a planet must be close enough to its star to have

liquid (liq-uid) water. The planet must be at just the right distance from its star to be warm but not too hot. If a planet is at the right distance from its star to possibly have living things, it is in the habitable (hab-it-a-ble) zone.

DID YOU KNOW??

Kepler-22b is the first planet found in the habitable zone of a star. It was found in December of 2011.

DID YOU KNOW??

The habitable zone around a star is often called the Goldilocks zone:
It is "just right" for life.



Vocabulary

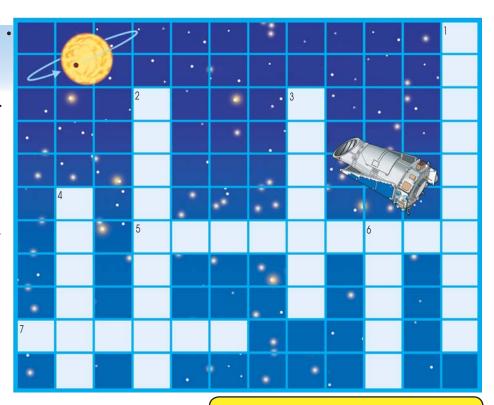
Complete the crossword puzzle.

Down

- 1. Kepler's light sensor
- 2. zone that is just right for life
- 3. to cross in front of a star
- 4. space object around a star
- **6.** to circle a star

Across

- instrument to see distant objects
- 7. German scientist Johannes ____



Weekly Lab

How does Kepler find planets around distant stars?

You need: a lamp with a frosted incandescent bulb,

modeling clay, string, safety goggles

Step 1: Make a small planet out of the clay.

Step 2: Stick the planet on the end of a piece of string.

Step 3: Move the planet in a circle or orbit (or-bit) around the lit lamp bulb (star). Can you see the planet in front of the star? Write it down.

Step 4: Move as far away from the lab as you can. Is it harder to see the planet?
Write it down.

Step 5: What if a star's light dims over and over in a pattern? What could it mean? Why do you think so? Talk with a partner.

A star's light dims a small bit when a planet moves in front of it. Kepler records when this happens.



ADULT SUPERVISION REQUIRED

ATTENTION TEACHERS: Please read the Teaching Notes before beginning this activity.



planet 🌰





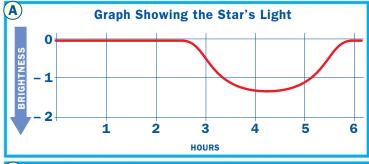


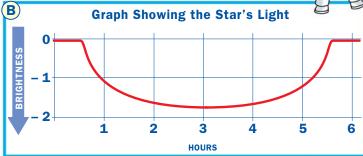
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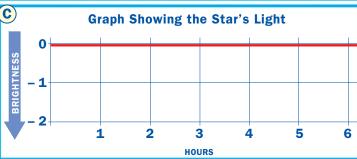


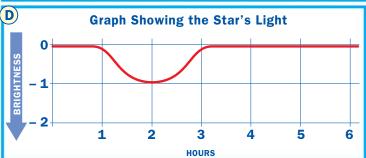
Math

The graphs below measure the brightness of light from a distant star.



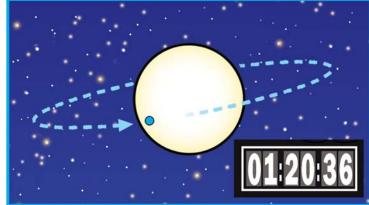






Answer the following questions in your science journal or on a separate sheet of paper.

- 1. What does it mean when the graph goes down?
- 2. What does it mean when the graph stays the same?
- **3.** Which graphs might show a planet crossing, or transiting, the star?
- **4.** Which graph shows a planet transiting for the longest time?





Writing in Science

Answer the questions in your science journal.



- Writing in Science Distant Stars
- Why are planets around other stars hard to find?
- Why do scientists use light brightness graphs?
- 3. Why look for other planets?







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Challenge

Study the table and use it to answer the questions.

Planet Name	Size Compared to Earth	Days to Orbit Star
Earth	same	365
Jupiter	11 times larger	4,330
Kepler-9b	9 times larger	19
Kepler-11b	2 times larger	10
Kepler-22b	2 times larger	290
Kepler-30c	14 times larger	60



- **1.** Which two planets in the table are most similar in size to the gas giant Jupiter?
- 2. Planets with short orbits are closest to their stars. Planets with longer orbits are farther away. Which planet is closest to its star? Which is farthest away?
- 3. Kepler-11b is not much bigger than Earth. Look at its orbit. Do you think it is in the habitable zone?
- **4.** Which planet has an orbit similar to Earth's? Do you think this planet is in the habitable zone?

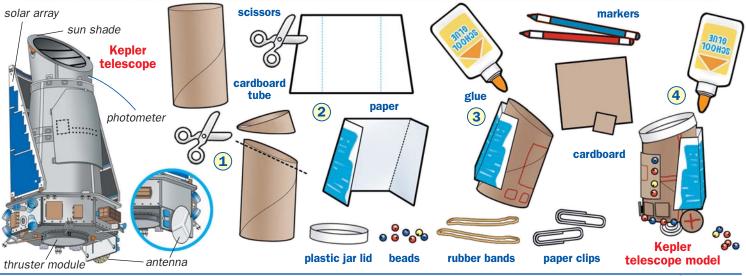


Bringing It Home

Adult Participation Recommended

Use the materials suggested here or other materials to make a model of the Kepler telescope. Do some research to find out about the various parts of Kepler. Write a paragraph in your science journal. Describe how you made each part of your model and how each part of the telescope is used.

You need: various materials such as cardboard tubes, cardboard, paper, beads, plastic jar lids, paper clips, rubber bands; scissors, glue, markers





"Pid you know the telephone was invented by accident?"

"Yes! And a lot of other important discoveries happened accidentally too."

"We'll learn more about accidental science in our next issue!"

